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Promoting a noise control program: Resources for successfully advocating a low-noise environment

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Abstract

Many noise control engineers find themselves in the position of "selling" their ideas to potential clients, management, or other stakeholders in a project. Whether working in industrial noise control, product design, community noise or acoustical engineering, a strong attitude of advocacy is essential. Although the advantages of a low-noise environment may seem unequivocal to professionals working in noise control, architectural acoustics or hearing conservation, their marketing and proposal efforts must convincingly answer the question, "Why control the noise?" Although hearing conservation is a commonly accepted justification for implementing a noise control program or project, it is not always the only (or even the primary) impetus. Often, the concepts of speech interference, safety, productivity and work environment comfort, when coupled with hearing conservation principles, can yield a more compelling rationale when clearly articulated and supported by evidence appropriate to the project. This paper will integrate these concepts into an advocacy package for use as a marketing or educational tool in both occupational and non-occupational contexts. A PowerPoint presentation will be available on request from the authors to assist noise control engineers and others in their advocacy of low-noise design and noise control projects.

The opinions expressed in this document are solely those of the authors and not necessarily those of the Army Medical Department or the Department of Defense.

1. Introduction

As a noise control engineer, you will undoubtedly encounter opportunities throughout your career for advocating an engineered approach to the solution of noise problems. Whether you are the in-house expert at a large industrial corporation, a consulting engineer hired specifically to address a particular noise problem, or a salesperson of low-noise equipment, you will need to be able to effectively convince project stakeholders that the pursuit of a noise control solution is not only the right thing to do, but a smart business decision as well. If an advocacy presentation can educate your audience while also clearly communicating the advantages of an engineered noise control solution, the presentation will be a well-used tool, worth developing and maintaining. The template for such a presentation may be continually updated and improved throughout your career, as you tailor it to meet the specific needs of subsequent projects.

In addition to the need for effective project-specific noise control advocacy, there are ample opportunities for noise control engineers to become involved in educational and community outreach efforts, often as a part of career awareness or environmental/health/safety events. Presentations and seminars conducted in association with these activities can pay huge dividends in terms of professional exposure and business contacts for the noise control engineer and his or her firm [1]. A presentation that may be easily adapted for different audiences and venues and that is virtually "ready to go" at a moment's notice will minimize the time invested in preparing for each event, thereby maximizing the number of presentations offered and, hence, the amount of exposure and potential new business.

This paper will focus on the content of project-specific advocacy presentations that are geared toward a business environment. A good presentation, developed into a template for this purpose, may be effectively modified to also fit a variety of educational or community outreach opportunities. Regardless of the specific audience, venue, or ultimate project goal, most advocacy challenges have one thing in common: the need for the noise control engineer to "sell" his or her audience on the advantages of an engineered noise control solution. If you are an in-house noise control specialist, you can assume your company is committed to the implementation of engineered controls. If you have been hired as a consultant, you can assume that, by hiring you, your client has accepted the possibility that an engineered solution may be necessary. Although your management or client obviously will be already *considering* an engineered solution, the eventual *implementation* will be the result of a project-specific decision that depends on the strength of the argument for engineered controls in light of their cost and technical complexity and the advantages of whatever non-engineered alternatives are relevant (e.g., wearing personal hearing protection, limiting operations, or perhaps doing nothing at all).

2. Content of a Noise Control Advocacy Presentation

Your advocacy presentation will be most effective if you customize it every time you use it, to make it relevant to the specific project, audience, and venue. In addition to tailoring the content to address technical and logistical issues that pertain to the specific noise problem at hand, you must tailor your presentation, and particularly your *approach*, to match the needs of the

audience. In most cases, you will be speaking to a group of decision-makers who may have limited scientific background and very little, if any, familiarity with the technical and regulatory nuances that must be considered as part of the decision-making process. Regardless of the nature of the proposed project, your advocacy presentation will be most effective if it is as comprehensive as possible and provides background information needed by your audience to make informed decisions. Specifically, the decision about whether or not to implement the proposed solution (or to decide between a number of alternative solutions that you are offering for consideration) will be spurred by the spirit of advocacy in the presentation. If your presentation is incomplete or without focus, your audience will be unmoved to accept your recommendations, no matter how technically appropriate they may be. If your presentation offers a clear background tutorial, a straightforward definition of the problem and clearly proposed solution, your audience will be more likely to follow, evaluate, and accept your proposal, as well as support the resulting outcomes. Since management support is always critical to the success of a noise control solution, the importance of educating the decision-making team cannot be overstated.

Several topics could be considered essential to a noise control advocacy presentation, depending on the industry, the nature of the project being considered and the technical level and composition of the audience. The following is a checklist for use in tailoring the presentation template to the specific needs of each project and audience, with specific references indicated that may be particularly appropriate for the audiences you may encounter. The topics are listed in the order in which they might logically be presented.

- *Effects of noise on hearing (mechanism of hearing and noise-induced hearing loss [NIHL])*
- *Noise exposure issues (time-weighted averages, etc.)*
- *Overview of OSHA noise standard CFR 1910.95 [2] or MSHA noise standard [3], where relevant*
- *Overview of an OSHA/MSHA hearing conservation program*
- *NIOSH recommendations for an effective hearing conservation program and other applicable "good practice" guidelines [4]*
- *Cost issues associated with a hearing conservation program (as an alternative to implementing engineered noise controls)*
- *Technical and practical disadvantages of personal hearing protection as an alternative to engineered solutions*
- *Engineered noise controls as a critical element of a hearing conservation program*
    - *Implementation of a noise control philosophy/program*
    - *Purchase of quiet equipment as a component of a noise control program*
- *Fundamentals of acoustics, as appropriate [5]*
- *Noise criterion (NC) curves and other architectural acoustics principles [6]*
- *Noise control approaches (noise control at the source, path, and receiver)[7,8]*
- *Technical noise control concepts[9,8]*
    - *Noise reduction/insertion loss*
    - *Absorption*

    - *Damping*
    - *Impact isolation*
- *Advantages of an engineered noise control solution (see Section 3 below)*
- *Criteria for evaluating a noise problem [10]*

3. Advantages of an Engineered Noise Control Solution

The reasons for implementing an engineered noise control solution are myriad, ranging from OSHA compliance (or, ideally, a genuine desire to prevent or eliminate NIHL) in an industrial facility, to improving productivity or accuracy of the work process (through reducing noise-related distractions in an office environment). In most cases, there is one primary motivation for considering an engineered solution, and therefore, sometimes only the key advantage of the solution (related to that primary motivation) is fully recognized and appreciated. Often, there are many secondary benefits, which may significant enough to merit consideration during the evaluation and decision-making process. Maintaining a library of discrete advocacy presentation units that may be employed individually or in combination will enable the noise control engineer to easily build a comprehensive presentation that is tailored to each situation encountered. The following is a conceptual list of some of the arguments in favor of implementing an engineered noise control solution that may be developed and presented in support of a proposed solution. Supporting material is abundant in the literature [11].

- *Enhances prevention or elimination of NIHL (not subject to limitations of personal hearing protectors)*
    - *Hearing loss incurred as a result of noise exposure affects performance and productivity*
- *Reduces potential for hearing loss due to inappropriate (or inconsistent) use of hearing protective devices on the job*
- *Ensures hearing conservation (as opposed to prevention of NIHL)*
- *Improves compliance with OSHA/MSHA noise standards*
- *Enhances compliance with OSHA Voluntary Protection Program guidelines*
- *Reduces workers' compensation risk*
- *Reduces other legal risks*
- *Promotes a "best practices" philosophy*
- *Removes operational restrictions placed by noise, such as administrative controls*
- *Avoids cost associated with the maintenance of a hearing conservation program (training, audiometric monitoring, personal hearing protectors, record-keeping and documentation)*
- *Reduces possible interactions with ototoxic substances at work or home*
- *Promotes compliance with relevant community noise statutes*
- *Promotes effective speech communication*
    - *Talkers wearing hearing protection have been shown not to talk loudly enough*
- *Allows clear audibility of alarm signals*
    - *Hearing protection may interfere with audibility of alarm signals*
- *Increases productivity*

- *Improves safety*
- *Creates a comfortable work (or home) environment*
    - *Reduces stress*
    - *Reduces other psychological effects such as distraction*
    - *Reduces non-auditory physiological effects*
    - *Reduces sleep interference*

4. Resources for Effective Noise Control Advocacy

A comprehensive PowerPoint library of noise control advocacy slides has been prepared by the authors and is available on request. The presentation incorporates the topics discussed above in discrete units that may be used (as is), or modified (particularly with customized photos that illustrate specific local, well-recognized noise control projects). The slides may be printed as overhead transparencies, or projected as a computerized PowerPoint slide show, depending on the audiovisual equipment available. The presentation is available on compact disc by email request [12]. Although this presentation was developed specifically for use in a project-advocacy environment, it may be easily adapted for use in other teaching contexts such as educational and community outreach. Paper copies of the slides may be distributed as handout materials by selecting the "handouts" option in the print pull-down menu.

Several resources are available to support the further development, customization, and delivery of the advocacy presentation. In particular, the use of audio demonstrations of acoustical concepts [5] is helpful for illustrating fundamental concepts in acoustics, and simulated hearing loss demonstrations are effective when discussing the effects of noise on hearing. Additionally, a PowerPoint presentation on noise measurement and noise control engineering is available and may be used to add technical depth to the presentation [13].

5. Conclusion

Noise control engineers, whether employed in corporate, consulting, or academic environments, have frequent opportunities to educate their management, clients, students and the general public about the benefits of engineered solutions to noise problems. Although each opportunity presents a unique challenge, there is a common advocacy process that must be successfully completed before the project itself may commence. A PowerPoint library of standard presentation elements has been developed as a resource for noise control engineers to use in developing effective advocacy presentations that may be customized for any audience or venue.

References

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